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16 August 1962


MEMORANDUM FOR: Director of Central Intelligence

SUBJECT: Summary of CORONA Film Marking Problems

1. On CORONA missions 9038, 9039, 9040 and 9041 a very serious degradation in image quality of film was encountered. This degradation took the form of an apparent fogging of the film in large areas of many individual photographic frames in a repeatable pattern. The fogging effect and consequent loss of information was separable from any atmospheric effects such as cloud cover, smoke, haze, low illumination or the like; and, in general, was not apparent until after the initial photographic passes had been made in each mission. The very first and very last photographic frames of each pass were much less effected by this phenomenon even late in a mission when the most serious degradations were present in most of the frames of each pass.

2. Efforts were begun to determine causes and cures for this problem by the governmental agencies and principal contractors when first discovered; however, with the continuance of the problem into mission 9041 and lack of a proven diagnosis a temporary stand-down in CORONA operations was decided.

3. Intensive investigation into many details such as materials and processes of camera building, vehicle configuration, film handling and processing, and re-examination of quality of earlier missions disclosed the following:

a. The phenomena occurred intermittently but to an almost unnoticeable extent in missions as early as 

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b. A significant and more restricting change in a vehicle pressure vent valve design coincided with the development of the phenomena into major proportions.

c. Vacuum chamber tests disclosed the ability to duplicate the phenomena in tests at certain pressure levels.

d. These same tests allowed visual observation of an electrical discharge effect which could very likely result in the fogging phenomena. The electrical discharge was not present at relatively high nor at extremely low pressures but did occur at pressures which could be present in the orbiting vehicle.

e. The change from single to double (stereo) camera and consequent doubling of film load between missions [] doubled the "outgassing" from the film load with attendant significant increase in vehicle internal pressure.

f. This information formed the basis for an hypothesis agreed to by Drs. Lund and Purcell on 13 August that an incipient problem in electrical discharge existed in the basic camera which was raised to major proportions by the vehicle pressure vent valve change and doubling of film capacity.

g. An immediate test in vacuum to be concluded late on 16 August including several vehicle pressure vent valve changes is expected to establish firmly the influence of vehicle internal pressure effects. This has been partially proven in previous tests. An intensive test program by both camera builders and film supplier and processor into means for suppression or elimination of the incipient electrical discharge problem is producing several possible solutions in the form of film roller coatings and grounding devices.

h. At best, the final proof of vehicle internal pressure as the principal reason for the present severity of the fogging problem from

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present tests would allow redesign of the vehicle pressure vent device plus final proof tests in time for resumption of CORONA launchings during the week of 27 August with major reduction in the extent of fogging. Complete elimination of the incipient electrical discharge problem is foreseeable but is not likely before late September.

SIGNED

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Acting Deputy Director
(Research)

cc: DDCI

Signature Recommended:

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DD/OSA/
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